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ABSTRACT

This paper synthesizes findings from the National Longitudinal Transition Study (NLTS) of Special Education Students concerning differences in the secondary educational and postschool experiences of male and female young people. NLTS provided data on more than 8,000 youths who received special education in secondary schools in the 1985-86 school year and results of followup telephone interviews in 1987 and 1990. Young women with disabilities differed from males in that they reported significantly lower involvement in activities outside the home especially in employment. They also differed from non-disabled females in showing low employment rates and lack of increased employment over time. Other differences between women and men with disabilities include the women's lower rate of full time employment and lower wages with the gaps widening with time out of school. In other areas women were less engaged in other productive activities outside the home, less likely to belong to organized groups or to see friends socially. Findings also suggested three factors contributing to these gender differences in post-school outcomes: (1) females in secondary special education tended to be more seriously impaired; (2) females were less likely to take occupationally specific vocational training in secondary school; and (3) the females were more likely to marry and become mothers soon after school than females in the general population. Numerous tables present the study's findings in detail. Two appendixes conclude the document; Appendix A provides greater detail on several methodological aspects of the NLTS and Appendix B provides a list of reports and papers available, based on the NLTS, with ordering information. (32 references) (DB)

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BEING FEMALE—A SECONDARY DISABILITY? GENDER DIFFERENCES IN THE TRANSITION EXPERIENCES OF YOUNG PEOPLE WITH DISABILITIES

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BEING FEMALE--A SECONDARY DISABILITY?
GENDER DIFFERENCES IN THE TRANSITION EXPERIENCES OF YOUNG PEOPLE WITH DISABILITIES

by Mary Wagner

In the 1980s, considerable attention was focused on the difficulties of young people with disabilities who were making the transition from secondary school to adult life. Policy initiatives at the federal level (Will, 1984), and program initiatives at the state and local levels (DeStefano and Wermuth, 1992) focused energy and resources on efforts to support more successful transitions. Attention to transition issues has continued at the highest levels of policymaking, as evidenced by the inclusion in the 1991 Individuals with Disabilities Education Act (PL101-476) of the requirement that all students with disabilities ages 16 or older have a written transition plan to set goals and establish support for their movement from secondary school to adult life.

The need for such efforts has been underlined by a growing body of follow-up and follow-along studies in individual states (e.g., Hasazi, Gordon, and Roe, 1985; Mithaug, Horiuchi, and Fanning, 1985; Edgar, Levine, Levine, and Dubey, 1988; Sitlington, Frank, and Cooper, 1989), which suggested that high dropout rates, low employment rates, and little postsecondary education marked the transition experiences of youth with disabilities. Early work from the National Longitudinal Transition Study of Special Education Students (NLTS; Wagner, 1989) provided the first look at the transition experiences of youth with disabilities nationally, revealing similar results.

Much of this research has taken pains to distinguish youth by the type of disability for which they received special education programs and services, and has provided extremely valuable information on the diversity of transition experiences of youth with different types of disabilities. This recognition of the powerful influence of disability on many aspects of youths' lives is central to the requirement in federal law that students receive individualized educations geared to their particular combination of abilities and disabilities.

However, these young people are more than their disabilities. Is special education research and programming focusing on disability differences to the exclusion of other characteristics of youth that also may have important influences on their school experiences and postschool outcomes?

The NLTS has undertaken a program of research that, in part, addresses other factors--in addition to disability--that relate to differences in youths' experiences and outcomes. This focus has important implications for special education transition policy and programming. If characteristics of youth other than disability have identifiable, consistent relationships to transition success, individualized education and transition plans that do not take these into account adequately may miss the mark in helping youth with disabilities in transition. Such plans and programs cannot be truly individualized if they fail to account for important characteristics of youth, other than disability, that either constrain or facilitate independence in adulthood.

This paper synthesizes findings from the NLTS regarding one such factor that distinguishes the experiences of youth both in secondary school and in the early postschool years--gender. Although much research on adolescents in the general population emphasizes the marked differences between young men and young women in many domains of their lives, research and programming in special education has not given gender differences similar attention. Yet, NLTS findings demonstrate that the experiences of young women with disabilities differ significantly from those of their male counterparts during secondary school and in the early years afterward.

NLTS findings are presented in response to the following questions regarding the experiences of males and females with disabilities:

- How do the patterns of experience of males and females with disabilities differ in the early years after leaving secondary school?
- Other than gender, what helps explain differences between males and females with disabilities in their postschool experiences?
- What are the implications for policy and programming of NLTS findings regarding gender differences?

NLTS data used to address these questions are drawn from a database that includes more than 8,000 youth who were ages 13 to 21 and special education students in secondary schools in the 1985-86 school year. The sample represents youth in the 11 federal special education disability categories used at that time. Data are weighted to permit findings to generalize nationally to youth in each disability group.* Data reported here were collected in 1987 and 1990 from telephone interviews with parents and/or youth and from students' school records from the 1985-86 or 1986-87 school years. Data are reported for males and females as a whole and, when sample sizes permit, within disability categories. Readers are cautioned that the small number of cases within some disability categories results in large standard errors; readers should emphasize consistency of relationships rather than the statistical significance of particular comparisons. (Appendix A has a more detailed description of data collection, data weighting, and analyses. Appendix B lists other products available from the NLTS, including full reports on sampling and data collection methods.)

Postschool Outcomes of Males and Females With Disabilities

NLTS findings demonstrate that young women with disabilities exhibited a markedly different pattern of experiences after leaving secondary school** than did their male counterparts with disabilities. In general, they demonstrated a significantly lower level of involvement, relative to young men, in many activities outside the home. In some respects, females with disabilities also differed from young women in the general population.***

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* Youth are assigned to disability category based on the primary disability designated by the schools or districts they attended in the 1985-86 school year.

** Postschool outcomes are reported for youth in 1987 when, as a group, they had been out of secondary school from a few months to 2 years. Outcomes are reported for the same youth in 1990, when they had been out of school between 3 and 5 years. The sample sizes of the two groups differ slightly because of missing data on individual items for small numbers of youth. (See Wagner, D'Amico, Marder, Newman, and Blackorby, in process, for more detailed longitudinal analyses of NLTS data regarding postschool outcomes.)

*** Comparisons with the general population are based on analyses of data from the National Longitudinal Survey of Youth (Center for Human Resource Research, 1988; see Appendix A for more information on comparison groups constructed from the NLSY).

Employment is one important domain of experience in which young men and women with disabilities differed markedly. Table 1 demonstrates that females with disabilities were significantly less likely than males to be employed, both when they had been out of secondary school less than 2 years, and 3 years later. In the early time period, 32% of young women with disabilities had been employed, compared with 52% of young men ($p<.001$).* Males experienced a 12 percentage point increase in their rate of employment ($p<.01$), while the 8 percentage point gain for young women was not a statistically significant improvement. Hence, when out of school 3 to 5 years, young women with disabilities lagged even further behind males (40% vs. 64%; $p<.001$). This pattern was consistent for youth in several disability categories. For example, males classified as seriously emotionally disturbed experienced an 11 percentage point gain in employment over the 3 year time period, so that 3 to 5 years after secondary school, 57% of males with that classification were employed. In contrast, females in that disability category experienced a 6% loss in employment, resulting in an employment rate 3 to 5 years after high school of 19%, a significantly lower rate than males ($p<.01$). Exceptions were youth classified as speech or orthopedically impaired, among whom employment rates for males and females 3 to 5 years after secondary school were quite similar.

Young women with disabilities not only differed from males with disabilities, but NLTS findings also suggest their experiences differed from their female peers in the general population. The smaller increase in employment among young women with disabilities relative to males is opposite to the pattern of change in employment observed for youth in the general population. Using data from the National Longitudinal Survey of Youth (NLSY), we note that among youth in the general population who had been out of school a comparable length of time to youth in the NLTS, men showed a 9 percentage point gain in employment, compared with 12% for young women. Hence, although young women in the general population were closing the gap in employment between the sexes, the gap continued to widen among youth with disabilities.

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* Statistical significance is denoted by p values presenting the number of chances out of 100 that the difference reported would occur due to chance alone.

Table 1

POSTSCHOOL EMPLOYMENT RATES OF YOUTH WITH DISABILITIES, BY DISABILITY CATEGORY AND GENDER

	Percentage of Youth Employed Among:					
	Males			Females		
	Out of School:		Difference	Out of School:		Difference
Disability Category	<2 Years	3-5 Years	<2 to 3-5	<2 Years	3-5 Years	<2 to 3-5
All conditions 1	52.0	64.3	12.3**	31.5	40.0	8.5
	(3.3)	(3.3)		(4.9)	(5.4)	
N	1,216	1,125		725	690	
Learning disabled	63.9	76.9	13.0*	44.3	52.4	8.1
	(4.7)	(4.2)		(10.5)	(10.6)	
N	269	255		68	67	
Emotionally disturbed	46.5	57.1	10.6	24.4	18.9	-5.5
	(6.1)	(6.5)		(10.2)	(10.2)	
N	169	142		51	43	
Speech impaired	52.9	63.6	10.7	44.9	68.3	23.4
	(9.3)	(9.6)		(10.5)	(9.9)	
N	83	76		50	50	
Mentally retarded	29.2	41.9	12.7	20.0	29.7	9.7
	(6.2)	(6.9)		(6.1)	(7.1)	
N	156	147		117	110	
Visually impaired	29.0	35.6	6.6	17.0	22.3	5.3
	(6.8)	(7.2)		(7.4)	(8.5)	
N	103	100		74	72	
Hard of hearing	63.0	61.8	-1.2	36.4	26.7	-9.7
	(9.3)	(9.6)		(10.6)	(9.9)	
N	79	75		70	67	
Deaf	42.7	54.5	11.8	30.5	29.3	-1.2
	(7.0)	(7.2)		(6.7)	(6.6)	
N	140	134		111	111	
Orthopedically impaired	20.7	19.8	-.9	19.8	23.4	3.6
	(7.1)	(7.4)		(8.6)	(9.6)	
N	86	80		83	77	
Other health impaired	40.8	28.6	-12.2	25.4	51.7	26.3
	(12.8)	(11.7)		(11.4)	(13.6)	
N	45	43		42	40	
Multiply handicapped	15.7	16.3	.6	13.2	17.5	4.3
	(8.0)	(8.9)		(9.0)	(10.6)	
N	69	58		42	37	

1 "All conditions" includes youth in all 11 federal special education disability categories. Data are presented only for groups with at least 30 males and females.

Difference between time periods is statistically significant at: +=p<.10; *=p<.05, **=p<.01; ***=p<.001

Standard errors are in parentheses. Source: NLTS parent/youth interviews.

Even when employed, young women with disabilities were significantly less likely than young men to be working full time, as shown in Table 2. In the first 2 years after high school, 17% of females with disabilities were working full time, compared with 28% of males ($p<.05$). The gap favoring males widened appreciable in the ensuing 3 years. The proportion of males with disabilities working full time increased by 24 percentage points ($p<.001$), whereas the increase in full-time female workers of 5 percentage points was not a statistically significant improvement. Thus, 3 to 5 years after secondary school, the rate at which youth worked full time was almost 2 1/2 times higher for males than females (52% vs. 22%; $p<.001$). Gains in full-time employment for males outstripped that for females in most disability categories. Further, the experience of young women with disabilities contrasts with that of females in the general population, who showed a shift toward greater full-time employment over a similar time period (24% to 40%; $p<.001$).

Considering wages earned by employed youth with disabilities, both working males and females experienced significant wage gains. However, the increase in the percentage of working youth who earned more than $6.00 per hour was much greater among males than females. Among males, 11% of workers out of school less than 2 years earned more than $6.00 per hour, a rate that increased by 34 percentage points ($p<.001$) to 44% of working males 3 years later. Among women with disabilities, only 1% had earned more than $6.00 per hour in the first time period, and the increase was only 22 percentage points ($p<.001$). Hence, the gap of 10 percentage points between males and females out of school less than 2 years widened to 21 percentage points 3 years later (44% of males and 23% of females earning more than $6.00 per hour; $p<.05$). (Too few males and females in each disability category were employed to examine wages separately by disability category.)

Beyond the domain of employment, young women with disabilities also were less likely to be involved outside the home than men. Building on the work of Edgar (1987) and others (Affleck, Edgar, Levine, and Kortering, 1990) and using NLTS data, Jay (1991) illuminated the concept of "productive engagement

Table 2
FULL-TIME EMPLOYMENT RATES OF YOUTH WITH DISABILITIES, BY DISABILITY CATEGORY AND GENDER

	Percentage of Youth Employed Full Time Among:					
	Males			Females		
	Out of School:		Difference	Out of School:		Difference
Disability Category	<2 Years	3-5 Years	<2 to 3-5	<2 Years	3-5 Years	<2 to 3-5
All conditions 1	28.3	52.4	24.1***	16.6	21.6	5.0
	(3.0)	(3.4)		(3.9)	(4.5)	
N	1,216	1,125		725	690	
Learning disabled	38.3	67.0	28.7***	27.4	26.2	-1.1
	(4.8)	(4.7)		(9.5)	(9.3)	
N	269	255		68	67	
Emotionally disturbed	16.4	42.7	26.3***	9.1	12.7	3.6
	(4.6)	(6.5)		(6.8)	(8.7)	
N	169	142		51	43	
Speech impaired	17.9	42.4	24.5*	7.3	29.6	22.3*
	(7.1)	(9.6)		(5.5)	(9.7)	
N	83	76		50	50	
Mentally retarded	14.5	27.0	12.5	9.2	18.0	9.2
	(4.8)	(6.2)		(4.4)	(6.0)	
N	156	147		117	110	
Visually impaired	13.7	24.8	11.1	6.6	7.9	1.3
	(5.1)	(6.5)		(4.9)	(5.5)	
N	103	100		74	72	
Hard of hearing	36.0	49.0	13.0	11.0	22.0	11.0
	(9.3)	(9.9)		(6.9)	(9.2)	
N	79	75		70	67	
Deaf	25.0	39.1	14.1	15.1	17.9	2.8
	(6.1)	(7.1)		(5.2)	(5.6)	
N	140	134		111	111	
Orthopedically impaired	7.8	6.3	-1.5	2.6	15.0	13.6
	(4.7)	(4.5)		(3.4)	(8.1)	
N	86	80		83	77	
Other health impaired	11.7	24.4	12.7	17.9	28.8	10.9
	(8.4)	(11.1)		(10.1)	(12.4)	
N	45	43		42	40	
Multiply handicapped	4.2	12.3	8.1	5.1	16.6	11.5
	(4.4)	(7.9)		(5.8)	(10.4)	
N	69	58		42	37	

1 "All conditions" includes youth in all 11 federal special education disability categories. Data are presented only for groups with at least 30 males and females.
Difference between time periods is statistically significant at: +=p<.10; *=p<.05, **=p<.01; ***=p<.001
Standard errors are in parentheses. Source: NLTS parent/youth interviews.

outside the home" by developing a measure indicating whether in the preceding year youth had been engaged in any activities related to work (paid or unpaid), job skills training, GED preparation, or postsecondary education. This thrust recognizes that there are many avenues of productive activity outside the home, any of which could make valuable contributions to the lives of youth with disabilities.

Table 3 demonstrates that even when activities related to volunteer work, job training, or postsecondary education are considered, in addition to employment, young women with disabilities were significantly less likely than men to be engaged outside the home, both in the early years after leaving high school, and later. When youth had been out of school 1 to 2 years, 69% of males and 51% of females had been productively engaged outside the home in the preceding year ($p<.05$). Males experienced a 13 percentage point gain in the subsequent 3 years ($p<.05$), compared to an 11 percentage point gain for females (not a significant difference for the smaller group of females). Again, we see the gap between males and females widening as time passed. When they had been out of school 3 to 5 years, 82% of males with disabilities had been productively engaged outside the home in the preceding year, compared with 62% of females ($p<.01$). Rates of engagement were higher and rates of increase greater for males than females in the majority of disability categories.

In the social arena as well, we see involvement of young women with disabilities diverging from men over time. The NLTS has examined the rate at which youth with disabilities belonged to social or community groups, as one indicator of social involvement. Table 4 demonstrates that, whereas males and females with disabilities were about equally likely to have belonged to groups in their first 2 years out of secondary school, females experienced a significant decline in group memberships over time, from 29% to 17% ($p<.05$), a decline not experienced by males (28% to 23%, not a statistically significant difference). Three to 5 years after secondary school, group membership rates were lower for females than for males with disabilities in 8 disability categories.

Table 3
ENGAGEMENT IN PRODUCTIVE ACTIVITIES OUTSIDE THE HOME[1] AMONG POSTSCHOOL YOUTH, BY DISABILITY CATEGORY AND GENDER

	Percentage Engaged in Productive Activities Outside the Home Among:					
	Males			Females		
	Out of School:		Difference	Out of School:		Difference
Disability Category	<2 Years[2]	3-5 Years	<2 to 3-5	<2 Years	3-5 Years	<2 to 3-5
All conditions[3]	69.1	81.7	12.6*	51.3	62.0	10.7
	(4.5)	(2.7)		(6.9)	(5.4)	
N	570	1,104		342	665	
Learning disabled	73.0	87.1	14.1*	49.1	68.0	18.9
	(6.2)	(3.4)		(13.2)	(10.2)	
N	146	252		34	65	
Mentally retarded	55.6	75.2	19.6	47.4	55.6	8.2
	(10.0)	(6.1)		(10.9)	(7.7)	
N	66	145		50	110	
Visually impaired	72.4	83.5	11.1	76.3	64.4	-11.9
	(9.7)	(5.7)		(12.5)	(9.9)	
N	47	97		34	69	
Hard of hearing	77.0	86.1	9.1	70.4	65.1	-5.3
	(12.0)	(6.9)		(13.8)	(10.8)	
N	35	75		36	65	
Deaf	79.5	74.1	-5.4	74.9	63.1	-11.8
	(7.6)	(6.5)		(8.3)	(6.8)	
N	74	129		55	103	
Orthopedically impaired	52.7	55.5	2.8	55.5	55.8	.3
	(12.6)	(9.5)		(14.5)	(11.5)	
N	39	77		39	74	

1 Productive activities outside the home include involvement in the preceding year in any kind of employment (paid or unpaid), job skills training, GED preparation, or postsecondary education.
2 The first time period includes only youth who were out of school between 1 and 2 years so that the preceding year did not include any secondary school. The second time period includes youth out of school between 3 and 5 years (those who were out of school less than 2 years at the earlier time period).
3 "All conditions" includes youth in all 11 federal special education disability categories. Data are presented only for groups with at least 30 males and females at each time period.
Difference between time periods is statistically significant at: +=p<.10; *=p<.05, **=p<.01; ***=p<.001
Standard errors are in parentheses.
Source: NLTS parent/youth interviews.

Table 4
GROUP MEMBERSHIPS AMONG POSTSCHOOL YOUTH, BY DISABILITY CATEGORY AND GENDER

	Percentage Belonging to Social/Community Group(s) Among:					
	Males			Females		
	Out of School:		Difference	Out of School:		Difference
Disability Category	<2 Years	3-5 Years	<2 to 3-5	<2 Years	3-5 Years	<2 to 3-5
All conditions 1	27.5	23.5	-4.0	29.2	16.8	-12.4*
	(3.0)	(2.9)		(4.7)	(4.1)	
N	1,176	1,123		704	682	
Learning disabled	28.8	21.2	-7.6	37.5	19.4	-18.1
	(4.5)	(4.1)		(9.9)	(8.4)	
N	260	253		66	67	
Emotionally disturbed	23.4	23.4	.0	23.2	6.9	-16.3
	(5.3)	(5.5)		(10.0)	(6.8)	
N	162	147		51	41	
Speech impaired	44.8	19.7	-25.1*	44.7	29.7	-15.0
	(9.5)	(7.7)		(10.7)	(9.8)	
N	80	76		49	49	
Mentally retarded	23.4	27.8	4.4	20.4	13.3	-7.1
	(5.9	(6.4)		(6.2)	(5.3)	
N	151	143		111	108	
Visually impaired	40.8	44.0	3.2	48.3	37.2	-11.1
	(7.4)	(7.5)		(10.0)	(9.8)	
N	102	99		73	73	
Hard of hearing	43.7	38.5	-5.2	23.6	19.3	-4.3
	(9.7)	(9.6)		(9.3)	(8.7)	
N	77	76		70	68	
Deaf	46.1	51.5	5.4	43.8	31.6	-12.2
	(7.1)	(7.3)		(7.4)	(6.3)	
N	134	131		108	109	
Orthopedically impaired	26.5	19.2	-7.3	27.2	28.4	1.2
	(7.8)	(7.2)		(9.7)	(10.2)	
N	86	81		81	77	
Other health impaired	36.3	30.0	-6.3	28.9	11.6	-15.3
	(12.5)	(11.9)		(11.6)	(8.7)	
N	45	43		42	40	
Multiply handicapped	28.7	27.9	-.8	10.9	13.2	2.3
	(10.5)	(11.0)		(9.1)	(9.7)	
N	64	57		36	35	

1 "All conditions" includes youth in all 11 federal special education disability categories. Data are presented only for groups with at least 30 males and females at each time period.
Difference between time periods is statistically significant at: +=p<.10; *=p<.05, **=p<.01; ***=p<.001
Standard errors are in parentheses. Source: NLTS parent/youth interviews.

Similarly, Table 5 shows that young women were significantly less likely than young men with disabilities to see friends socially 4 or more days per week, both when they had been out of school less than 2 years (40% vs. 57%; $p<.05$) and 3 years later (27% vs. 43%; $p<.05$). This pattern of lower involvement with friends was consistent for women in 7 disability categories, significantly so in the case of those with learning disabilities (22% of women vs. 47% of men seeing friends 4 or more days per week, $p<.05$).

Factors Related to Gender Differences In Postschool Outcomes of Youth with Disabilities

How do we explain the markedly different patterns of experiences for young women and young men with disabilities? Are the NLTS findings simply additional examples of "the great divide" between the sexes (Weiss, 1991)? But if gender alone accounts for the differences between males and females with disabilities, why aren't those differences mirrored among young men and women in the general population? Are there characteristics or experiences of females with disabilities that set them apart, not only from their male counterparts with disabilities, but from young women in the general population?

NLTS data suggest at least three areas in which to look for partial explanations for the differences in the patterns of experiences between males and females with disabilities:

- *Differences in the abilities and disabilities of males and females in secondary special education.* Males and females in secondary special education are significantly different in the disability categories they represent and in their functional abilities.
- *Differences in the secondary school experiences of male and female students with disabilities.* Males and females in secondary special education take different courses, differences that would be expected to prepare them differently for their postschool transitions.
- *Differences in marriage and parenting experiences of males and females with disabilities.* Young women with disabilities are significantly more likely than males to be parenting, a factor that has broad implications for other postschool outcomes.

Each of these is discussed in the following sections.

Table 5
RATE AT WHICH POSTSCHOOL YOUTH SAW FRIENDS FREQUENTLY[1], BY DISABILITY CATEGORY AND GENDER

	Percentage of Youth Who Saw Friends 4 or More Days Per Week Among:					
	Males			Females		
	Out of School:		Difference	Out of School:		Difference
Disability Category	<2 Years	3-5 Years	<2 to 3-5	<2 Years	3-5 Years	<2 to 3-5
All conditions 2	57.0	42.9	-14.1**	40.5	27.4	-13.1+
	(3.4)	(3.5)		(5.5)	(5.1)	
N	1,131	1,072		676	656	
Learning disabled	60.2	47.3	-12.9+	43.2	22.5	-20.7
	(5.0)	(5.1)		(10.7)	(9.1)	
N	248	241		65	64	
Emotionally disturbed	58.7	45.3	-13.4	54.5	38.5	-16.0
	(6.4)	(6.5)		(12.7)	(12.9)	
N	153	134		44	38	
Speech impaired	52.7	31.9	-20.8	48.8	30.5	-18.3
	(9.5)	(9.5)		(10.8)	(9.8)	
N	80	70		48	49	
Mentally retarded	51.3	33.3	-18.0	33.8	29.0	-4.8
	(7.1)	(6.7)		(7.5)	(7.2)	
N	145	143		108	103	
Visually impaired	46.1	36.7	-9.4	35.2	22.3	-12.9
	(7.7)	(7.4)		(10.1)	(8.6)	
N	99	97		67	71	
Hard of hearing	57.0	51.8	-5.2	44.1	24.9	-19.2
	(10.1)	(10.3)		(11.2)	(9.9)	
N	72	72		67	64	
Deaf	52.6	42.1	-10.5	40.7	34.1	-6.6
	(7.3)	(7.1)		(7.4)	(7.3)	
N	130	126		105	101	
Orthopedically impaired	35.6	35.8	.2	22.1	49.1	27.0
	(8.7)	(9.1)		(9.1)	(11.4)	
N	83	78		80	76	
Other health impaired	44.3	32.4	-11.9	46.2	32.8	-13.4
	(13.2)	(12.4)		(13.3)	(12.8)	
N	43	42		41	40	
Multiply handicapped	24.9	23.7	-.8	23.5	33.8	10.3
	(10.1)	(10.9)		(12.7)	(13.5)	
N	63	54		34	35	

1 Frequently=4 or more day per week.
2 "All conditions" includes youth in all 11 federal special education disability categories. Data are presented only for groups with at least 30 males and females at each time period.
Difference between time periods is statistically significant at. +=p<.10; *=p<.05, **=p<.01; ***=p<.001
Standard errors are in parentheses. Source: NLTS parent/youth interviews.

Variations in Abilities and Disabilities of Male and Female Students in Special Education

Although in the secondary school student population as a whole, males and females are fairly equally represented, among secondary students in special education, females are a minority. Overall, females were 32% of secondary school special education students in the 1985-86 school year. Further, the proportion of females varied widely between disability groups. Figure 1 demonstrates that the underrepresentation of females in secondary special education primarily results from the predominance of males in two of the largest disability categories--learning disabled and seriously emotionally disturbed--in which about three-fourths of students were male. Genders were more nearly equally represented in other categories, although males outnumbered females in all other categories as well, except deaf/blind.

Because of this uneven distribution of males and females within disability categories, when we compare young women with disabilities with young men, we are comparing groups that represent disability categories in

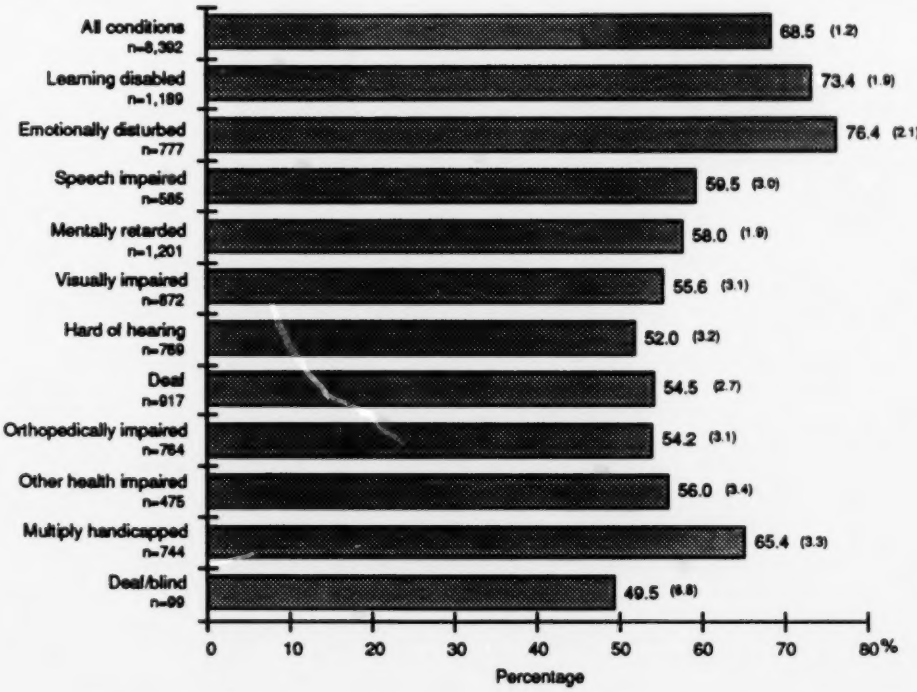

FIGURE 1 PERCENTAGE OF MALES AMONG YOUTH WITH DISABILITIES

Source: Parent interviews and school records abstracts.

different proportions. Table 6 shows that whereas more than 60% of males were categorized as learning disabled, only 47% of females were so classified (p<.001). Similarly, females were significantly less likely than males to be classified as seriously emotionally disturbed (8% vs. 12%; p<.05). In contrast, almost one-third of female students with disabilities were classified as mentally retarded, compared with only 20% of male students (p.<001). Female students also were twice as likely to be classified as hard of hearing or deaf, although the differences were not statistically significant.

Table 6

VARIATIONS IN DISTRIBUTION OF DISABILITY CATEGORIES BY GENDER

	Males	Females
Percentage of youth classified as:		
Learning disabled	59.8	47.1***
	(1.6)	(2.2)
Emotionally disturbed	11.7	7.9*
	(1.0)	(1.2)
Speech impaired	2.9	4.3
	(.5)	(.9)
Mentally retarded	20.2	31.8***
	(1.3)	(2.1)
Visually impaired	.6	1.0
	(.2)	(.4)
Hard of hearing	.7	1.4
	(.3)	(.5)
Deaf	.6	1.2
	(.3)	(.5)
Orthopedically impaired	1.0	1.8
	(.3)	(.6)
Other health impaired	1.1	1.8
	(.3)	(.6)
Multiply handicapped	1.5	1.7
	(.4)	(.6)
Deaf/blind	<.1	.1
	(.0)	(.1)
N	5,141	3,251

Difference between males and females is significant at: +=p<.10; *=p<.05; **p<.01; ***p<.001.
Standard errors are in parentheses.
Source: NLTS school/district rosters.

Differences in disability classification between males and females represent more than the peculiarities of special education referrals and labeling. They suggest real differences in the abilities youth bring to the transition enterprise. The NLTS has measured the abilities of youth in several ways. Youths' abilities to apply basic mental functions, such as reading and computing, to everyday activities have been measured by asking parents to rate youths' abilities to do four tasks: read common signs, tell time on a clock with hands, count change, and look up telephone numbers and use the phone. Parents rated youths' abilities on a 4-point scale ranging from "very well" (4 points) to "not at all well" (1 point). Summing the scores on the 4 tasks creates a scale ranging from 4 to 16. A second measure of ability is the the most recent IQ score included in students' school records.

Table 7 shows that parents of female students rated young women marginally lower on the functional mental skills scale than did parents of male students. Overall, females averaged 13.4, compared with an average score of 14 for males ($p<.01$). Within disabilities, the picture is mixed. In five categories, including learning disabled, emotionally disturbed, and mentally retarded, the three largest, the abilities of females were rated lower than males. A notable exception is youth classified as other health impaired, among whom males' mean score was significantly lower than females' (12.8 vs. 14.5; $p<.001$).

The table also depicts a significantly lower IQ score for female students overall (74 vs. 82; $p<.001$). This pattern of marginally lower IQ scores for female students is consistent in 9 of 11 disability categories. Differences are statistically significant for youth classified as learning disabled (84 vs. 88; $p<.05$), emotionally disturbed (79 vs. 88; $p<.001$), and orthopedically impaired (74 vs. 80; $p<.10$).

Disability and gender are not the only systematic differences between male and female secondary students in special education. NLTS data suggest that female students were significantly more likely to be from minority

Table 7

VARIATIONS IN MEASURED MENTAL SKILLS BY GENDER

Disability Category	Average Functional Mental Skills Scale Score[1]		Average Measured IQ	
	Males	Females	Males	Females
All conditions[2]	14.0	13.4**	81.6	74.4***
	(.1)	(.2)	(.8)	(1.2)
N	3,975	2,610	2,741	1,631
Learning disabled	14.7	14.4	88.2	84.1*
	(.1)	(.2)	(.8)	(1.4)
N	681	230	566	180
Emotionally disturbed	14.6	14.3	88.3	79.3***
	(.1)	(.3)	(1.1)	(2.4)
N	455	138	334	93
Speech impaired	14.4	14.4	81.8	79.2
	(.2)	(.3)	(2.0)	(3.0)
N	273	179	129	81
Mentally retarded	11.8	11.6	61.3	58.7
	(.2)	(.3)	(1.1)	(1.2)
N	486	374	458	342
Visually impaired	12.3	11.9	88.0	84.9
	(.3)	(.4)	(2.5)	(3.3)
N	398	297	266	197
Hard of hearing	14.3	14.4	89.0	89.2
	(.2)	(.2)	(2.6)	(2.2)
N	338	321	170	167
Deaf	13.6	13.9	95.2	90.2
	(.2)	(.2)	(2.0)	(2.2)
N	398	345	255	212
Orthopedically impaired	13.4	13.5	80.1	73.6+
	(.3)	(.3)	(2.5)	(2.3)
N	332	296	197	158
Other health impaired	12.8	14.5***	78.1	77.7
	(.3)	(.4)	(3.4)	(4.6)
N	232	179	92	51
Multiply handicapped	8.7	8.1	50.6	48.1
	(.4)	(.5)	(3.3)	(3.7)
N	348	211	255	141
Deaf/blind	7.5	7.5	--	--
	(1.0)	(.8)		
N	34	40		

1 Parents rated youths' abilities to do four tasks (read common signs, tell time on a clock with hands, count change, and look up telephone numbers and use the phone) on a 4-point scale ranging from "very well" (4 points) to "not at all well" (1 point). Summing the scores on the 4 tasks creates a scale ranging from 4 to 16.

2 "All conditions includes youth in all 11 federal special education disability categories. Data are presented only for groups with at least 30 youth.

Difference between males and females is significant at: +=p<.10; *=p<.05; **p<.01; ***p<.001.

Standard errors are in parentheses.

Source: Functional measures from NLTS parent interviews; IQ data from students' school records.

ethnic backgrounds than were male students. Table 8 demonstrates that 39% of female students with disabilities were minorities, compared with 33% of male students ($p<.05$). The disproportionate representation of minorities among female students holds for all disability categories, although the difference was statistically significant only for those classified as orthopedically impaired (43% vs. 32%; $p<.10$) or other health impaired (54% vs. 39%; $p<.05$).

Table 8
PERCENTAGE OF STUDENTS WITH DISABILITIES WHO WERE MINORITIES, BY DISABILITY CATEGORY AND GENDER

	Males	Females
Percentage of youth who were minority among those classified as:		
All conditions[1]	33.0	39.3*
	(1.7)	(2.4)
N	4,341	2,800
Learning disabled	31.2	62.7
	(2.5)	(4.5)
N	751	243
Emotionally disturbed	30.9	38.8
	(3.0)	(5.7)
N	494	150
Speech impaired	45.5	46.3
	(4.3)	(5.3)
N	294	196
Mentally retarded	37.8	40.5
	(2.9)	(3.3)
N	524	412
Visually impaired	35.2	38.0
	(4.0)	(5.1)
N	435	320
Hearing impaired[2]	34.4	39.7
	(3.0)	(3.4)
N	789	693
Orthopedically impaired	31.9	42.7+
	(4.4)	(4.7)
N	362	319
Other health impaired	39.4	53.6*
	(4.7)	(5.4)
N	249	188
Multiply handicapped	33.0	31.3
	(4.5)	(5.8)
N	399	237

1 "All conditions includes youth in all 11 federal special education disability categories. Data are presented only for groups with at least 30 males and females.

2 Hearing impaired includes youth classified as deaf or hard of hearing. These categories were combined to increase the precision of estimates for those groups.

Difference between males and females is significant at: +=p<.10; *=p<.05; **p<.01; ***p<.001.

Standard errors are in parentheses.

Source: NLTS parent interviews and/or school/district rosters.

Both the greater severity of disability and minority status of female students with disabilities relative to males suggest they might have been even more at risk of poor transition outcomes than males. Lower functional skills may have resulted in lower employability. Minority status also has been shown to relate to lower employment rates and a lower likelihood of productive engagement outside the home for youth with disabilities (D'Amico, 1991; Jay, 1991).

Secondary School Experiences of Male and Female Students with Disabilities

We have seen that female students with disabilities represent a different mix of disability categories than male students and that they have marginally lower abilities, based on several measures. Given the individualized nature of special education programs, one could expect that these differences in abilities would be reflected in differences in programs and experiences in secondary school. In turn, differences in programs and other school experiences might have affected the paths males and females took in their transitions to adulthood.

In fact, the secondary school programs of male and female students with disabilities were quite similar in many respects.* The vast majority of male and female students attended comprehensive secondary schools (89% and 87%, respectively), and were assigned to specific grade levels (92% and 89%) rather than ungraded special education programs. Male and female students with disabilities spent virtually the same proportion of their class time in regular education classes in their most recent school year (53% and 50%). They also spent equal amounts of their class time taking academic courses (52% and 51%) and were equally likely to have taken at least one nonacademic class in their most recent school year (86% and 88%). Male and female students with disabilities were equally likely to have received help from a

* School program data are from the 1985-86 or 1986-87 school years. They are taken from the NLTS Survey of Secondary Special Education Programs and from students' school records.

tutor, reader, or interpreter (15% and 16%), and to have received personal counseling (18% and 17%) or physical therapy from their schools (6%) in the preceding year.

Significant gender differences do appear, however, when we examine students' enrollment in vocational education classes. Male and female students with disabilities were about equally likely to have been enrolled in vocational education in their most recent school year (61% and 60%). However, Table 9 reveals that the kind of vocational training they received differed significantly. Female students were significantly less likely than males to be exposed to occupationally-specific vocational training, i.e., training in skills relevant to a specific job, such as auto mechanics, office occupations, or food service. Whereas more than half of male students with disabilities took occupationally-oriented vocational education in their most recent school year (51%), only 41% of female students did so ($p<.001$). This pattern was consistent in 8 of 10 disability categories; the difference was statistically significant for those classified as mentally retarded ($p<.01$), other health impaired ($p<.05$), and learning or speech impaired ($p<.10$).

In contrast, the vocational training provided female students was more likely to emphasize home economics; 41% of female students took such courses in their most recent school year, compared with 21% of males ($p<.001$). Consistent with this, female students also were significantly more likely to have received occupational therapy or life skills training (including home economics) in the preceding year; 38% of female students received such training, compared with 22% of males ($p<.001$). Receipt of life skills training was higher among female students in all disability categories.

Gender differences also were apparent in the content area of vocational courses taken by male and female students with disabilities (Table 10). For example, only 2% of male vocational students with disabilities took courses in personal service occupations; 13% of female students did so ($p<.001$). Similarly, female vocational students with disabilities were more than twice as likely as males to receive training in food service (14% vs. 6%; $p<.01$) or in office occupations (42% vs. 19%; $p<.001$). Conversely, male vocational students with disabilities were significantly more likely than females to be enrolled in courses in machine shop (20% vs. 3%; $p<.001$) or construction

Table 9

VARIATIONS IN VOCATIONAL EDUCATION PARTICIPATION, BY DISABILITY CATEGORY AND GENDER

Disability Category	Percentage Taking Occupationally Specific Vocational Education In Their Most Recent School Year Males	Females
All conditions[1]	50.9	40.7***
	(1.7)	(2.3)
N	3,538	2,239
Learning disabled	54.3	45.3+
	(2.5)	(4.4)
N	627	210
Emotionally disturbed	41.3	36.3
	(2.9)	(5.4)
N	399	115
Speech impaired	44.9	33.6+
	(4.0)	(4.8)
N	227	155
Mentally retarded	50.1	36.7**
	(2.7)	(3.0)
N	508	373
Visually impaired	42.1	45.3
	(4.0)	(5.1)
N	327	237
Hearing impaired[2]	60.3	53.3
	(3.0)	(3.3)
N	637	584
Orthopedically impaired	35.7	28.0
	(4.3)	(4.2)
N	284	224
Other health impaired	47.5	31.8*
	(4.9)	(5.0)
N	175	118
Multiply handicapped	22.5	25.8
	(3.9)	(5.0)
N	320	192

1 "All conditions includes youth in all 11 federal special education disability categories. Data are presented only for groups with at least 30 youth.

2 Hearing impaired includes youth classified as deaf or hard of hearing. These categories were combined to increase the precision of estimates for those groups.

Difference between males and females is significant at: +=p<.10; *=p<.05; **p<.01; ***p<.001.

Standard errors are in parentheses.

Source: Students' school records from their most recent school year.

Table 10

CONTENT AREA OF VOCATIONAL EDUCATION OF SECONDARY SCHOOL STUDENTS WITH DISABILITIES, BY GENDER

Content Area of Vocational Education	Males	Females
Percentage of vocational students receiving training in:		
Agriculture	12.9	8.2
	(1.6)	(2.0)
Manufacturing/industrial arts	8.0	2.6
	(1.3)	(1.2)
Machine shop/engine repair	20.2	2.6***
	(1.9)	(1.2)
Construction trades	34.9	5.0***
	(2.2)	(1.6)
Commercial arts	8.8	3.9
	(1.3)	(1.4)
Office occupations	19.4	42.5***
	(1.8)	(3.6)
Service occupations		
Personal services	1.9	12.8***
	(.6)	(2.4)
Food service	5.9	13.6**
	(1.1)	(2.5)
Custodial services	3.3	2.4
	(.6)	(.9)
	1,839	984

Difference between males and females is significant at: +=p<.10; *=p<.05; **p<.01; ***p<.001.
Standard errors are in parentheses.
Source: Students' school records for their most recent school year.

trades (35% vs. 5%; p<.001). These gender differences were apparent regardless of disability category. For example, in all categories, young men were substantially more likely to have taken machine shop or construction trades than were young women. In all categories, young women were more likely to have had training in food service occupations, and in all categories except visually impaired, they were more likely than males to have had training in office occupations, although sample sizes limit the statistical significance of these comparisons.

Similar gender differences were found in a national study of course-taking among high school students in the general population (Tuma et al., 1988). Despite the specific intent of the Carl D. Perkins Act of 1984 to support sex equity in vocational education, recent research has concluded that "over the past two decades, sex segregation in vocational enrollments has changed little. Most traditional patterns of enrollment persist" (Wirt, Muraskin, Goodwin, and Meyer, 1989).

The lower level of involvement of females with disabilities in occupationally-specific vocational education may help explain their lower employment rates and engagement rates in their postschool years. Using NLTS data, D'Amico has demonstrated that occupationally specific vocational training in secondary school is significantly related to a higher likelihood of postschool employment, independent of the disability and other demographic characteristics of students (D'Amico, 1991). Jay found a similar relationship between occupational training and productive engagement outside the home (Jay, 1991). However, those analyses also demonstrated a significant relationship of gender to employment and productive engagement outside the home, independent of whether youth had occupational training, suggesting that school program differences were only a partial explanation for gender differences in postschool outcomes.

Secondary school experiences outside the classroom also differed for males and females with disabilities. NLTS data suggest that female students were involved in fewer activities outside of school than males; two such activities include socializing with friends and having jobs. A lower level of involvement in the social and employment domains during secondary school were the precursors to the lower involvement in those domains we see for women with disabilities in their postschool years.

Table 11 indicates that female students were significantly less likely than males to see friends outside of school frequently (i.e., 6 or 7 days a week; 27% vs. 37%, $p<.01$). Rates of seeing friends frequently outside of school were lower for females in 9 of 10 disability categories. Further, multivariate analyses relating various characteristics of youth to the

Table 11

ACTIVITIES OUTSIDE OF SCHOOL OF SECONDARY SCHOOL STUDENTS, BY DISABILITY CATEGORY AND GENDER

Disability Category	Percentage Seeing Friends Out of School 6 to 7 Times Weekly		Percentage With Jobs	
	Males	Females	Males	Females
All conditions[1]	36.7	26.8**	60.5	46.2***
	(2.5)	(2.9)	(2.2)	(3.2)
N	2,518	1,674	2,617	1,725
Learning disabled	39.1	30.8	66.5	53.1*
	(3.4)	(5.5)	(3.2)	(5.7)
N	269	134	387	142
Emotionally disturbed	44.8	38.0	68.0	52.4+
	(4.2)	(7.6)	(3.9)	(7.8)
N	254	75	265	78
Speech impaired	37.2	31.0	51.6	39.4
	(5.3)	(5.9)	(5.3)	(6.1)
N	161	117	170	123
Mentally retarded	27.9	18.9	42.2	37.3
	(3.5)	(3.5)	(3.7)	(4.2)
N	300	227	310	233
Visually impaired	32.0	21.4	49.2	42.4
	(5.0)	(5.6)	(5.3)	(6.6)
N	285	200	291	208
Hard of hearing	28.6	19.6	63.3	46.8*
	(5.1)	(5.1)	(5.4)	(6.3)
N	237	215	245	217
Deaf	26.3	38.5	60.5	43.0*
	(5.4)	(5.9)	(5.1)	(5.8)
N	228	212	259	221
Orthopedically impaired	20.0	15.0	24.7	26.8
	(4.9)	(3.9)	(5.3)	(4.8)
N	228	199	229	202
Other health impaired	22.2	18.0	41.4	39.5
	(4.8)	(5.1)	(5.6)	(6.4)
N	171	117	175	119
Multiply handicapped	18.2	9.6	34.9	25.6
	(4.5)	(4.2)	(5.6)	(6.2)
N	253	158	265	162

1 "All conditions" includes youth in all 11 federal special education disability categories. Data are presented only for groups with at least 30 males and females.

Difference between males and females is significant at: +=p<.10; *=p<.05; **p<.01; ***p<.001.

Standard errors are in parentheses

Source: NLTS parent interviews.

frequency with which they saw friends outside of school found a significantly lower rate of seeing friends frequently for females, independent of disability and other differences (Newman, 1991).

Regarding jobs held by secondary school students, the NLTS has shown that students with disabilities were about as likely as students in the general population to have had jobs while in secondary school (D'Amico, 1991). However, Table 11 demonstrates that female students with disabilities were significantly less likely to be employed than their male counterparts; 6 of 10 males were employed, compared with 46% of females ($p<.001$). The lower rate of employment was consistent for females in 9 of 10 disability categories. Differences were statistically significant for those classified as learning disabled, hard of hearing, or deaf ($p<.05$) and those with emotional disturbances ($p<.10$).

Perhaps having somewhat fewer activities outside of school helps to explain why the school performance of female students with disabilities was at least as high as male students and, on some measures, higher, despite their marginally greater severity of disability and greater proportion of minorities. For example, the grade point average of female students who received grades* was marginally, but significantly higher than male students (Table 12; 2.1 vs. 1.9; $p<.05$). Similarly, the percentage of students who

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* NLTS data reveal that 11% of students with disabilities did not receive grades in any courses in their most recent year in secondary school. Receiving grades was strongly related to the nature and severity of students' disabilities. For example, only 5% of students categorized as learning disabled did not receive any grades, whereas 24% of those with mental retardation did not receive any grades. More than half of students with low functional mental skills did not receive grades (55%), compared with only 4% of students with high functional mental skills. Almost two-thirds of students who were not assigned to a specific grade level and 54% of those who attended special schools did not receive grades in any courses. Hence, when we analyze course grades as measures of school performance, we are "creaming" the special education student population by eliminating from the analysis students with more severe disabilities and lower functional skills. These students tend to age out of school rather than dropping out. Eliminating these students from analyses by including course grade data results in somewhat higher dropout rates than would be the case if all students were included.

** Readers are cautioned that failure rates may actually have been marginally higher than those reported here. There is reason to believe that the grades abstracted from students' records may slightly overestimate grade performance for some students. For a subsample of students, transcripts were collected and grades were compared to those reported by data abstractors on the school record abstract form. In a handful of cases, failed courses were not included on the record abstract form because students received no credit for them. It is unknown to what extent this form omission characterizes other record abstract data; to the extent that it does, failure rates are underestimated.

Table 12

VARIATIONS IN GRADES RECEIVED BY STUDENTS WITH DISABILITIES IN THEIR MOST RECENT SCHOOL YEAR, BY DISABILITY CATEGORY AND GENDER

Disability Category	Average GPA		Percentage Failing 1 or More Courses	
	Males	Females	Males	Females
All conditions[1]	1.9	2.1*	33.2	26.5*
	(.0)	(.1)	(1.8)	(2.4)
N	2,896	1,798	3,472	2,200
Learning disabled	1.9	2.0	36.0	30.5
	(.0)	(.1)	(2.8)	(4.5)
N	582	198	608	208
Emotionally disturbed	1.7	1.7	46.0	36.9
	(.1)	(.1)	(3.5)	(6.4)
N	345	100	387	115
Speech impaired	2.0	2.1	39.6	28.8
	(.1)	(.1)	(4.7)	(5.4)
N	216	143	224	150
Mentally retarded	2.0	2.1	22.4	20.9
	(.1)	(.1)	(2.5)	(2.8)
N	362	253	501	367
Visually impaired	2.4	2.6	21.3	11.6
	(.1)	(.1)	(4.2)	(4.2)
N	283	216	324	237
Hearing impaired[2]	2.4	2.5	16.1	14.0
	(.1)	(.1)	(2.6)	(2.6)
N	579	542	627	571
Orthopedically impaired	2.5	2.5	14.5	15.9
	(.1)	(.1)	(3.7)	(3.9)
N	227	167	265	204
Other health impaired	2.2	2.2	26.7	24.2
	(.1)	(.1)	(5.2)	(6.0)
N	149	102	170	115
Multiply handicapped	2.2	2.4	7.8	5.3
	(.1)	(.2)	(2.7)	(2.9)
N	144	72	329	200

1 "All conditions includes youth in all 11 federal special education disability categories. Data are presented only for groups with at least 30 youth.

2 Hearing impaired includes youth classified as deaf or hard of hearing. These categories were combined to increase the precision of estimates for those groups.

Difference between males and females is significant at: +=p<.10; *=p<.05; **p<.01; ***p<.001.

Standard errors are in parentheses.

Source: Students' school records from their most recent school year.

received 1 or more failing course grades in their most recent school year was significantly lower among female students than males (26% vs. 33%; $p<.05$). This pattern was consistent in 9 of 10 disability categories.

However, the rate of dropping out of school among female students was just as high as that of males. Of students who left school in the 1985-86 or 1986-87 school years, 34% of both males and females left school by dropping out. The comparable dropout rates for female and male students in somewhat surprising in light of the stronger grade performance of females; higher grade performance has been found to be one of the strongest predictors of persistence in secondary school (Wagner, 1991). However, the reasons reported by parents for their children dropping out of school suggests that males and females were dropping out for different reasons. Parents of 23% of female dropouts reported that their daughters dropped out of school because of pregnancy or marriage, reasons reported by only 1% of parents of male dropouts ($p<.05$). NLTS data suggest that early marriage and parenting helped to shape many aspects of the postschool experiences of young women with disabilities.

Marriage and Parenting Among Males and Females with Disabilities

As young people age, many increasingly base their social networks in their own independent households, often developed through marriage and childbearing, which act as important sources of social support beyond friends and members of a youth's family of origin. Although getting married and having children generally are positive aspects of adult independence, marriage and parenting during adolescence and early adulthood can be problematic. Early pregnancies, particularly among single mothers, can be obstacles to school completion, employment, and postsecondary education, thereby lowering the prospects for future adult financial independence. Further, early marriages are noted for their high rate of dissolution in later years (McCarthy and Menken, 1979, Morgan and Rindfuss, 1985; Hofferth and Hayes, 1987). Children of teen mothers, too, often experience negative effects, both cognitive and social (Wadsworth, Taylor, Osborn, and Butler, 1984; Brooks-Gunn and Furstenberg, 1986; Hayes, 1987).

As shown in Figure 2, when they had been out of secondary school less than 2 years, 12% of young women with disabilities were married or living with someone of the opposite sex*, a significantly higher rate than for young men (4%: $p<.10$). Further, young women with disabilities experienced a greater increase in their marriage rates than men in the ensuing 3 years; by the time they had been out of school 3 to 5 years, 30% of women were married or living with someone of the opposite sex, an 18 percentage point increase over their earlier rate ($p<.01$), and twice the rate of young men with disabilities ($p<.01$).

When youth with disabilities had been out of school less than 2 years, marriage rates for both sexes were in line with the marriage rates of peers in the general population, based on NLSY data (15% for females, 4% for males). The increase in the marriage rate of men with disabilities (11 percentage points) was smaller than that of young men in the general

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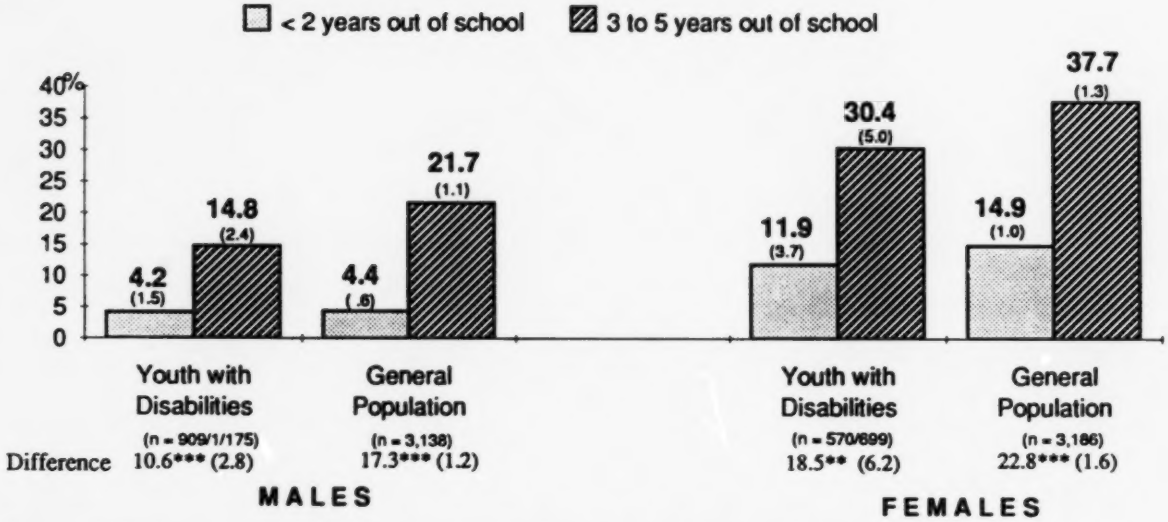
FIGURE 2 MARRIAGE OR LIVING WITH PERSONS OF THE OPPOSITE SEX AMONG OUT-OF-SCHOOL YOUTH WITH DISABILITIES AND YOUTH IN THE GENERAL POPULATION



Source: NLTS parent/youth interviews and NLSY (Center for Human Resources Research, 1988).
Standard errors in parentheses.

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* Marital status was determined by asking whether youth were "single, never married; engaged, married or living with someone of the opposite sex; widowed; or divorced." Therefore, this discussion refers to youth who were either married or living with someone of the opposite sex, even when referred to more briefly as "married."

population (17 percentage points). However, the rate of increase in the proportion of young women with disabilities who were married (18 percentage points) was much closer to the rate of increase among young women in the general population (23 percentage points). Three to 5 years after high school men with disabilities were significantly less likely to be married than men in the general population, whereas there was no significant difference in marriage rates for women with disabilities and women in the general population.

Women in all disability categories except multiply handicapped were more likely to be married than their male counterparts with the same disabilities (Table 13), significantly so in the cases of women with learning disabilities (41% vs. 18%; $p<.05$), mental retardation (21% vs. 8%; $p<.01$), or other health impairments (30% vs. 3%; $p<.05$), or among youth who who were hard of hearing (36% vs. 11%; $p<.05$) or deaf (25% vs. 11%; $p<.10$).

Marriage rates were significantly higher among white females than black women with disabilities (39% vs. 7%; $p<.001$). (White and black men with disabilities did not differ in the rate at which they were married--10% and 11%.) The marriage rates for women dropouts, reached 45% 3 to 5 years after secondary school, a significantly higher rate than for male dropouts (12%; $p<.05$) and a markedly higher rate than for women graduates (27%), although the latter difference is not statistically significant because of the small number of women dropouts.

Given the frequency with which youth with disabilities were married or living with someone of the opposite sex, it is not surprising that many youth were parents. However, parenthood was significantly more common among females with disabilities (41%) than males (16%; $p<.001$). This difference may be in part explained by the higher proportion of minorities among women with disabilities relative to men; early sexual activity and pregnancy are more common among black than white youth (Miller and Moore, 1990).

Further, young women with disabilities were significantly more likely to be mothers than females in the general population who also had been out of secondary school 3 to 5 years (41% vs. 28%; $p<.05$), despite the fact that

Table 13
MARRIAGE RATES OF POSTSCHOOL MALES AND FEMALES, BY DISABILITY CATEGORY

	Percentage Married/Living With Someone of the Opposite Sex Among:					
	Males			Females		
	Out of School:		Difference	Out of School:		Difference
Disability Category	<2 Years	3-5 Years	<2 to 3-5	<2 Years	3-5 Years	<2 to 3-5
Learning disabled	5.5	17.8	12.3+	19.7	41.4	21.7
	(3.8)	(3.8)		(8.8)	(10.5)	
N	205	262		56	66	
Emotionally disturbed	.4	14.1	13.7**	11.5	26.8	15.3
	(1.0)	(4.4)		(9.1)	(11.2)	
N	107	153		38	44	
Speech impaired	1.0	16.4	15.4*	14.4	20.7	6.3
	(2.4)	(7.0)		(8.1)	(8.6)	
N	56	80		40	50	
Mentally retarded	3.8	8.5	4.7	3.3	21.2	17.9*
	(2.9)	(3.8)		(3.0)	(6.3)	
N	114	155		89	112	
Visually impaired	.0	9.5	9.5*	10.4	16.5	6.1
	(.0)	(4.4)		(7.0)	(7.4)	
N	87	101		60	74	
Hard of hearing	.8	10.9	10.1	8.2	36.2	28.0*
	(1.8)	(6.2)		(6.8)	(10.8)	
N	69	76		57	67	
Deaf	2.2	11.4	9.2	8.7	24.8	16.1*
	(2.2)	(4.6)		(4.0)	(6.3)	
N	117	136		95	113	
Orthopedically impaired	.0	15.5	15.5*	5.7	17.7	12.0
	(.0)	(6.5)		(6.1)	(8.6)	
N	69	84		65	77	

1 "All conditions" includes youth in all 11 federal special education disability categories. Data are presented only for groups with at least 30 males and females.
Difference between time periods is statistically significant at: +=p<.10; *=p<.05, **=p<.01; ***=p<.001
Standard errors are in parentheses. Source: NLTS parent/youth interviews.

they were no more likely to have been married. One might hypothesize that the predominance of poverty and single-parent families among youth with disabilities relative to the general population (Marder and Cox, 1991), factors related to early adolescent sexual activity and pregnancy (Forste and Heaton, 1988; Miller and Bingham, 1989), would help explain differences in parenting rates between women with disabilities and women in the general population. However, no such difference is observed for men; young men with disabilities were fathers at about the same rate as their peers in the general population (16% vs. 14%), despite the greater incidence of poverty and single-parent families among males with disabilities.

Table 14 demonstrates that gender differences in parenting rates held true for youth with various disabilities. For example, 28% of deaf women reportedly were parents, compared with 10% of young men who were deaf ($p<.05$). Similarly, 50% of women with learning disabilities were parents, compared with 19% of men with learning disabilities ($p<.01$).

Among white youth, females were parents significantly more often than males (44% vs. 13%; $p<.001$); however, parenting rates were very similar for black women and men (30% and 24%) and not significantly higher for Hispanic women than men (39% vs. 25%). Female dropouts were particularly likely to be parents (54%) relative to estimates both for other young women with disabilities (38% of graduates, 14% of those who aged out; $p<.01$ for the latter comparison) and to male dropouts (22%; $p<.05$) and graduates (13%; $p<.01$). This finding is consistent with the frequency with which parents cited pregnancy and or childrearing as the reason young women had dropped out of school, as mentioned earlier.

As expected, marriage was strongly associated with parenthood, with three-fourths of married women being mothers 3 to 5 years after secondary school (76%); 57% of married men were fathers. However, marriage is no longer the social prerequisite for childbearing that it once was. Research has documented the rapid rise in the rate of parenthood among single persons in the general population. For example, the number of live births to unmarried women ages 20 to 24 rose from 21 births per 1,000 women in 1950 to

Table 14

PARENTING RATES OF MALES AND FEMALES 3 TO 5 YEARS AFTER SECONDARY SCHOOL, BY DISABILITY CATEGORY

Primary Disability Category	Percentage Reported To Be Parents	
	Males	Females
All conditions	16.5	40.6***
	(2.5)	(5.4)
N	1,171	699
Learning disabled	19.4	50.0**
	(3.9)	(10.7)
N	260	66
Emotionally disturbed	18.2	48.4*
	(4.9)	(12.6)
N	154	44
Speech impaired	22.1	39.5
	(7.8)	(10.4)
N	80	50
Mentally retarded	9.9	31.3**
	(4.1)	(7.1)
N	155	112
Visually impaired	5.3	14.8
	(3.4)	(7.1)
N	101	74
Hard of hearing	16.1	48.3*
	(7.3)	(11.2)
N	76	67
Deaf	10.2	27.8*
	(4.4)	(6.5)
N	135	113
Orthopedically impaired	2.1	12.9
	(2.6)	(7.6)
N	82	77
Other health impaired	2.8	35.6*
	(4.3)	(13.1)
N	45	40
Multiply handicapped	3.0	3.9
	(3.8)	(5.2)
N	66	44

1 "All conditions includes youth in all 11 federal special education disability categories. Data are presented only for groups with at least 30 youth.

Difference between males and females is significant at: +=p<.10; *=p<.05; **p<.01; ***p<.001.

Standard errors are in parentheses.

Source: NLTS parent/youth interviews.

57 per 1,000 in 1988 (OERI, 1991). Among youth with disabilities, 20% of single women were parents, compared with 6% of single men ($p<.01$). Single parenthood was significantly more common among young women with disabilities than among young women in the general population (12%; $p<.10$); the rates of parenthood among single men were similar, regardless of disability.

Overall, single mothers constituted 13% of young women with disabilities who had been out of secondary school 3 to 5 years. Single mothers were primarily minority women (55%), although minorities were only 35% of youth with disabilities as a whole. Their average age was 22. More than one-fourth of single mothers were high school dropouts (26%). Almost half of single mothers with disabilities (49%) lived with their parents or other adult family members, 19% lived with a roommate, and 31% lived alone with their children.

As hypothesized earlier, the relatively high rate of parenting among young women with disabilities may be, by choice or necessity, an alternative to participating in activities outside the home, such as employment. D'Amico reports from the NLTS (1992) that, among young women with disabilities who were not working outside the home and were not looking for work, 42% reported that raising children and household responsibilities were reasons for not seeking employment; only 2% of young men who were not looking for work reported family responsibilities as an obstacle to seeking employment ($p<.001$).

Table 15 provides further evidence that mothers with disabilities were less likely than women without children to be involved in common activities outside the home. For example, only 31% of young mothers were working competitively, compared with 46% of women who were not mothers. Similarly, 48% of mothers were engaged in work- or school-related activities outside the home, compared with 70% of young women without children. No such differences were observed for young men with disabilities; fathers were not more or less likely to be involved in work, postsecondary education, or other productive activities outside the home than were young men who were not fathers.

Table 15

VARIATIONS IN PARTICIPATION IN WORK- AND SCHOOL-RELATED ACTIVITIES OUTSIDE THE HOME, BY GENDER AND PARENTING STATUS AMONG YOUTH WITH DISABILITIES 3 TO 5 YEARS AFTER SECONDARY SCHOOL

	Females		Males	
Out-of-Home Activities	Mothers	Non-Mothers	Fathers	Non-Fathers
Percentage of youth who were competitively employed	30.7	45.9	70.3	63.1
	(9.5)	(6.2)	(8.6)	(3.6)
N	176	507	117	1,000
Percentage of youth who attended any postsecondary school	7.5	9.6	1.2	5.5
	(5.4)	(3.6)	(1.9)	(1.7)
N	175	508	121	1,019
Percentage of youth who were productively engaged* outside the home in the preceding year	48.4	69.6	84.6	80.8
	(10.7)	(5.7)	(7.1)	(2.9)
N	163	493	108	975

* Productive activities outside the home were defined to include: employment, whether paid or volunteer; postsecondary school enrollment; or participation in job training.

Summary and Implications

NLTS findings demonstrate that young women with disabilities had a pattern of experience in the early years after secondary school that differed significantly from men. In many aspects of their lives, from the employment to the social domains, they were less involved outside the home than their male counterparts with disabilities. Less involvement in employment and other productive activities outside the home and less social involvement raise concerns about the long-term prospects of females with disabilities becoming financially independent and personally satisfied with their adult lives.

NLTS findings also suggest at least three factors that may have contributed to the gender differences in postschool outcomes of young people with disabilities. First, data indicate that females in secondary special education represented a different combination of abilities and disabilities

than males. As a group, females were more seriously impaired; even among males and females within the same disability category, females had marginally greater functional deficits than males. Why? What combination of policies, home or school practices, or etiology led to the predominance of males in some disability categories and the greater severity of disability of females in many categories?

There are several potential explanations. Perhaps it is simply biological--for some time the conventional wisdom has held that some disabilities, particularly learning disabilities, simply occur more frequently among males. Recent research questions this assumption however (Shaywitz, 1990) and suggests that learning disabilities occur as frequently among girls, but fail to be recognized so that girls are less likely to be referred to special education. If so, differential standards for referral of boys and girls seem to play a role. Proponents of this explanation argue that boys are more likely to exhibit behaviors that make them difficult for regular education teachers to teach; special education referrals are a way to get problem students, more often boys, out of the regular classroom (Roach, 1991). Although most referrals to special education occur in the elementary school years, low rates of declassification from special education would result in more males than females being in special education at the secondary level.

NLTS data suggest another possibility. At the secondary school level, girls are less involved in activities outside of school that might detract from a focus on school work; consistent with this, their grades are better. If girls "try harder" than boys, the gap between ability and performance that often is the trigger for a referral to special education may be smaller or less frequent among girls. If girls "do more with what they have," they may be more frequently declassifed from special education once referred. Hence, fewer females would be special education students at the secondary level, and those that were would be girls with greater functional deficits that would be less easy to compensate for by effort alone.

A second factor that may contribute to differences in the postschool outcomes of males and females with disabilities involves their secondary

school experiences. Recent research has provided striking evidence of "how schools shortchange girls" (AAUW, 1991). Although that research concerned the general population of girls, NLTS data demonstrate similar experiences for girls with disabilities. Female students with disabilities were significantly less likely than males to take occupationally specific vocational training in their most recent year in secondary school. When they took it, their training was more likely to be in service occupations, which traditionally pay less than the trades for which males were being trained. Occupational training has been shown to relate positively to improved performance in secondary school and to a greater likelihood that youth will be employed or go on to postsecondary education or training after leaving school. Girls were not reaping the benefits of occupational training in high school to the extent their male counterparts were. Outside the classroom, too, girls were less likely to have jobs during high school and less likely to be socially active, precursors to their lower level of involvement outside the home in their postschool years.

Finally, the common experience of marriage and motherhood among young women with disabilities has implications for many other aspects of their lives. Three to 5 years after leaving school, almost one-third of women with disabilities were married, compared with 15% of men. Although young women with disabilities were no more likely to be married than women in the general population, they were significantly more likely to be mothers. When they had been out of school 3 to 5 years, 41% of women with disabilities were mothers, compared with 28% in the general population of young women. Only 16% of men with disabilities were reported to be fathers. One in 5 single women with disabilities were mothers, a significantly higher incidence of single-parenthood than among young women in the general population. Motherhood was particularly common among female dropouts with disabilities; 54% were mothers, a significantly higher rate of parenting than among females who graduated or among male dropouts with disabilities.

The frequency with which young women with disabilities were mothers in their early years after leaving school--particularly single mothers--is cause for concern. Why were they more likely than other young women to be mothers at such an early age? If they were pregnant by choice, why were other options, such as further schooling or employment, not seen as more attractive

or within reach? If not by choice, why did young women with disabilities not have the knowledge and support to avoid pregnancy? If we look back at the school programs provided to females with disabilities, were they as likely as other women students to receive information on sexuality? If sex education was routinely part of regular biology classes, for example, and students with disabilities were not enrolled in those classes, were they provided similar information in other ways? Or did students with disabilities forfeit exposure to sexuality issues and related health topics as a result of their special education placements? In an era in which sexual activity risks exposure to AIDS, are students with disabilities also forfeiting information they may need to protect themselves from that danger?

There also is concern for the future of young mothers with disabilities and their children. We know that youth with disabilities, compared to the general population of youth, came from households that were disproportionately poor and headed by single parents (Marder and Cox, 1991). Are we seeing the beginning of another generation of children disproportionately from single-parent families? The challenges of disability and single-parenting may put future economic independence out of reach for many young mothers with disabilities. Low maternal education, poverty, and single-parent families all are risk factors that do not bode well for the futures of the children born to young women with disabilities (Furstenberg, Brooks-Gunn, and Morgan, 1987).

In these findings, schools can find several possible directions for action to improve the prospects for females with disabilities after secondary school. Schools can re-examine their referral policies and practices, particularly at the teacher level, in an effort to determine why females have to be more severely impaired to get help from special education. A concerted effort is needed to provide occupational training in gender-neutral content areas to all students for whom employment after secondary school is a goal. Finally, the reality of motherhood for females with disabilities needs to be reflected in programming. Education in issues of sexuality needs to be available to all students. For young women who are mothers, providing childcare so that mothers can continue their education and training, both in secondary school and beyond, may be the support needed to enable young mothers to acquire the skills for their future financial independence.

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Appendix A
BACKGROUND INFORMATION ON THE NLTS

This appendix provides somewhat greater detail on several methodological aspects of the NLTS, including:

- Data collection components.
- Sampling of districts, schools, and students.
- Weighting of NLTS data.
- Estimation and use of standard errors.
- Construction of comparison groups from the general population using the National Longitudinal Survey of Youth (U.S. Department of Labor).

Components of the NLTS

The NLTS has several components:

- ***The Parent/Youth Survey.*** In the summer and fall of 1987, parents were interviewed by telephone to determine information on family background and expectations for the youth in the sample, characteristics of the youth, experiences with special services, the youths' educational attainments (including postsecondary education), employment experiences, and measures of social integration. Parents rather than youth were selected as respondents for the first wave of data collection because of the need for family background information and because, with most students still being in secondary school and living at home, parents were believed to be accurate respondents for the issures addressed. The survey was repeated in 1990, when youth were interviewed if they were able to respond.
- ***School Records.*** In 1987 information was abstracted from students' school records for the most recent year in secondary school (either the 1985-86 or 1986-87 school year). This information related to courses taken, grades received (if in a graded program), placement, related services received from the school, status at the end of the year, attendance, IQ, and experiences with minimum competency testing. School transcripts were collected in 1990 for youth who had been in secondary school at any time since the 1986-87 school year.
- ***School Program Survey.*** In 1987, schools attended by sample students in the 1986-87 school year were surveyed for information on enrollment, staffing, programs and related services offered to secondary special education studnets, policies affecting special education programs and students, and community resources for the disabled.
- ***Student School Program Survey.*** In 1990, this survey obtained information about youth who still were in secondary school. Respondents were teachers familiar with students' school programs. They reported about students' in-class performance, class size, school climate, and transition planning activities that had occurred for each student.
- ***Explanatory Substudies.*** Studies involving subsamples of youth in selected disability categories examined in greater depth students' secondary school programs, the patterns of transition outcomes achieved by youth who were out of secondary school, and the relationship between school experiences and outcomes. Data were collected for in-school youth in 1988 and 1989 and for out-of-school youth in 1989.

The NLTS Sample

The initial NLTS sample was constructed in two stages. A sample of 450 school districts was selected randomly from the universe of approximately 14,000 school districts serving secondary (grade 7 or above) students in special education,* which had been stratified by region of the country, a measure of district wealth involving the proportion of students in poverty (Orshansky percentile), and student enrollment. Because not enough districts agreed to participate, a replacement sample of 178 additional districts was selected. More than 80 state-supported special schools serving secondary-age deaf, blind, and deaf-blind students also were invited to participate in the study. A total of 303 school districts and 22 special schools agreed to have their students selected for the study.

Analysis of the potential bias of the district sample indicated virtually no systematic bias that would have an impact on study results when participating districts were compared to nonparticipants on several characteristics of the students served, participation in Vocational Rehabilitation programs, the extent of school-based and community resources for the disabled, the configuration of other education agencies serving district students, and metropolitan status (see Javitz, 1990 for more information on the LEA sample). The one exception was a significant underrepresentation of districts serving grades kindergarten through eight. Many of these districts did not consider themselves as secondary school districts, even though they served grades seven and eight, which are considered secondary grade levels. In addition, bias may exist on factors for which data were not available for such comparisons.

Students were selected from rosters compiled by districts, which were instructed to include all students in special education in the 1985-86 school year who were in grades 7 through 12 or whose birthdays were in 1972 or before, whether or not they were served within the district or outside the district (e.g., in state-supported residential schools). Rosters were stratified into 3 age groups (13 to 15, 16 to 18, over 18) for each of the 11 federal special education disability categories and youth were randomly selected from each age/disability group so that approximately 800 to 1,000 students were selected in each disability category (with the exception of deaf-blind, for which fewer than 100 students were served in the districts and schools included in the sample).

In part because of the time lapse between sample selection and data collection, many students could not be located at the addresses or telephone numbers provided by the schools. Of the 12,833 students selected for the sample, about one-third could not be reached by telephone for the 1987 parent interview. (For more than half of these, addresses and telephone

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* The 1983 Quality Education Data, Inc. (QED) database was used to construct the sampling frame. QED is a private nonprofit firm located in Denver, Colorado. Special education cooperatives and other special service units were not sampled directly (83% of special education students are served directly by school districts; Moore et al., 1988). However, instructions to districts for compiling student rosters asked districts to include on their listing any students sent from their district to such cooperatives or special service units. Despite these instructions, some districts may have underreported students served outside the district.

numbers were not provided by the schools/districts from which they were sampled.) This relatively high rate of inability to reach sample members confirmed the importance of including in the NLTS a substudy of nonrespondents to determine whether those who were reached for the telephone interview were a representative sample of the population to which the study was intended to generalize. To identify whether bias existed in the interview sample, interviewers went to 28 school districts with relatively high nonresponse rates to locate and interview in person those who could not be reached by telephone. Of the 554 sought for in-person interviews, 442 were found and interviewed, a response rate of 80%. A comparison of telephone interview respondents with in-person interview respondents showed that the telephone sample underrepresented lower-income households. The sample was reweighted to adjust for that bias, as described in the next section.

Data from 1990 on trends in postschool outcomes are based on the responses of 1,990 youth who satisfied four conditions: 1) they were enrolled in special education at a secondary school in the 1985-86 school year, 2) they left secondary school by September 1987, 3) their parent or guardian completed an interview in the wave 1 data collection effort, and 4) either the parent or youth completed a telephone interview or mail questionnaire in the wave 2 data collection effort. These youth were weighted to represent all youth enrolled in special education in the 1985-86 school year who had left secondary school by September 1987.

Weighting Procedures and the Population to Which Data Generalize

Youth with disabilities for whom data could be gathered were weighted to represent the U.S. population of students in special education in the 1985-86 school year who were in grades 7 through 12 or at least 13 years old. Because it is a sample of students at various ages, the NLTS sample does not generalize to youth who had dropped out of school before that age. For example, the sample of 18-year-olds generalizes to youth who were 18 and still in secondary school in 1985-86, not to all 18-year-olds with disabilities, many of whom may had left school at an earlier age.

In performing sample weighting for wave 1 (1987), three mutually exclusive groups of sample members were distinguished:

(A) Youth whose parents responded to the telephone interview.

(B) Youth whose parents did not respond to the telephone interview but were interviewed in person.

(C) Youth whose parents did not respond to either the telephone or in-person interviews but for whom we obtained a record abstract.

A major concern in weighting was to determine whether there was a nonresponse bias and to calculate the weights in such a way as to minimize that bias. There was a potential for three types of nonresponse bias:*

(1) Bias attributable to the inability to locate respondents because they had moved or had nonworking telephone numbers.

(2) Bias attributable to refusal to complete an interview (only 3% of those available to be interviewed refused).

(3) Bias attributable to circumstances that made it infeasible to locate or process a student's school record.

Of these three types of nonresponse, the first was believed to be the most frequent and to have the greatest influence on the analysis. Type 1 bias also was the only type of nonresponse that could be estimated and corrected.

The magnitude of type 1 nonresponse bias was estimated by comparing responses to items available for the three groups of respondents (after adjusting for differences in the frequency with which youth in different disability categories were selected and differences in the size of the LEAs selected). Group A was wealthier, more highly educated, and less likely to be minority than group B. In addition, group A was more likely to have students who graduated from high school than groups B or C (which had similar dropout rates). Groups A and B were compared on several additional measures for which data were unavailable for group C. The youth described by the two groups were similar on these additional items, including gender, employment status, pay, functional skills, association with a social group, and length of time since leaving school. Adjusting sample weights to eliminate bias in the income distribution eliminated bias in parental educational attainment and ethnic composition, but did not affect differences in dropout rates. Groups B and C were large enough that if they were treated the same as group A in the weighting process, the resulting dropout distribution would be approximately correct.

Sample weighting involved the following steps:

- Data from the first groups of sample members were used to estimate the income distribution for each disability category that would have been obtained in the absence of type 1 nonresponse bias.
- Respondents from all three groups were combined and weighted up to the universe by disability category. Weights were computed within strata used to select the sample (i.e., LEA size and wealth, student disability category and age).

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* We assumed that nonrespondents who could not be located because LEAs did not provide student names would have chosen to participate at about the same rate as parents in districts in which youth could be identified. The remaining nonrespondents would presumably have been distributed between the three types of nonresponse mentioned above.

- Weights from three low-incidence disability categories (deaf, orthopedically impaired, and visually impaired) were adjusted to increase the effective sample size. These adjustments consisted primarily of slightly increasing the weights of students in larger LEAs and decreasing the weights of students in smaller LEAs. Responses before and after these weighting adjustments were nearly identical. In addition, the three deaf/blind youth from medium-size or smaller districts, who had large weights, were removed from the sample to increase the effective sample size. Thus, NLTS results do not represent the very small number of deaf/blind students in medium-size or smaller LEAs.
- The resulting weights were adjusted so that each disability category exhibited the appropriate income distribution estimated in step 1 above. These adjustments were modest (relative to the range of weights within disability category); the weights of the poorest respondents were multiplied by a factor of approximately 1.6 and the weights of the wealthiest respondents were multiplied by a factor of approximately .7.

Because analyses of postschool outcomes included 1990 data for only a subset of youth, new weights were needed for 1990 data. The first step in weighting the 1,990 out-of-school youth was to identify a group of 3,046 youth who had been enrolled in special education in the 1985-86 school year, who had left secondary school by September 1987, and for whom we had sufficient data so that these youth had been given a weight in the wave 1 analysis. (This did not require that the parent of the youth complete a parent/guardian interview; having a school record abstract was sufficient to receive a wave 1 weight.) Use of this wave 1 weight allowed the results for these 3,046 youth to be projected to the corresponding national population (that is, youth who were enrolled in special education in secondary school in 1985-86 and who had left secondary school by September 1987).

The second step in weighting was to use the group of 3,046 youth and their wave 1 weights to calculate distributions of the following:

- ***Age***—The primary categories were 15 to 17 years, individual years of age from 18 to 22, and a combined category of 23 and above.
- ***Ethnic background***—The primary categories were black; white; hispanic; and a combined category for Indian/Alaskan, Asian/Pacific Islander; and other. In addition there was a category for "don't know" or refusals, and a category for missing (typically because the data collection instrument that was completed for youth did not ask for this information).
- ***School completion status***—The primary categories were graduated, aged out, and a combined category of dropped out, suspended, or expelled. In addition there was a category for "don't know" or "plans to return to school."
- ***Gender.***
- ***Household income in 1986*** (or 1990 if 1986 data was not available). The primary categories were under $12,000; $12,000 to $19,999; $20,000 to $24,999; under $25,000 but otherwise unspecified; $25,000 to $37,999; $38,000 to $50,000; and over $50,000. Those with incomes of $25,000 or over but otherwise unspecified were grouped with those with household incomes between $25,000 and $37,999. In addition there was a category for those with missing information and a category for those who responded "don't know," refused to answer, or indicated that the youth was institutionalized.

The third step was the use of a weighting program to calculate weights for the 1,990 youth so that they matched the demographic distributions of the 3,046 youth. The weighting was accomplished using Deming's algorithm, which iteratively modified the wave 1 weights for the 1,990 youth until they generated demographic marginals that were very similar to those obtained using the 3,046 youth. Each disability class was weighted separately and in general the demographic marginals were matched within a fraction of 1 percent. (Only for the deaf/blind, where sample sizes were very small, did any marginals fail to match within 1 percent, and here they differed no more than 2%.)

Estimation of Standard Errors

The NLTS stratified cluster sample introduces design effects that reduce the precision of estimates for a sample of a given size, compared with a simple random sample. The design effects within the NLTS affect the precision of estimates to varying degrees for different subpopulations and different variables. Pseudo-replication is widely accepted as a variance estimation technique in the presence of design effects. However, it is not cost-effective for estimating the standard errors of the thousands of variables and subpopulations tabulated in the numerous NLTS reports and its statistical almanacs. Therefore, pseudo-replication was conducted on a limited number of variables to calibrate a cost-effective approximation formula, using the following procedures:

- A set of 25 variables representing the parent interview, school program survey, and record abstract was identified for the purpose of developing a statistical approximation formula; these included 16 nominal variables and 9 continuous variables.
- Standard errors of the weighted means of the selected variables were estimated in two ways. The first procedure involved pseudo- replication. For each variable, standard errors were calculated for students in each disability category and for the total sample (300 standard errors) using a partially balanced experimental design specifying how youth were to be allocated to 16 half-samples. The sample was split on the basis of the school districts and special schools from which youth originally were sampled. Districts and schools were paired on the basis of enrollment and a measure of poverty, and one member of each pair was assigned to each half-sample. Sample weights were computed for each half-sample as if those in the half-sample were the only study participants.

  The following formula was used to estimate the standard error of the mean for youth in all conditions:

$$\text{Standard error} = [(1/16) \sum_i (M_i - M)^2]^{1/2}$$

  where M_i is the mean calculated for youth in one of the 16 half- samples), M is the mean response calculated from the full sample, and the summation extends over all 16 half-samples. (Note that responses to questions from the school program survey were attached to the records of students in the responding schools so that means for these items were computed using student weights.)

- The second estimation procedure involved an approximation formula based on an estimate of the effective sample size for each disability category and the total sample. The sampling efficiency (E) for a group was calculated using the following formula:

$$E = M_w^2/(M_w^2+S_w^2)$$

where M_w and S_w are the mean and standard deviation of the student weights over all members of the group. The approximation formula for the standard error of the weighted mean of nominal variables is:

$$\text{Standard error} = [P(1-P)/(N \times E)]^{1/2}$$

where P is the full-sample weighted proportion of "yes" responses to a particular question in the group, N is the unweighted number of "yes" or "no" responses to the question in the group, and E is the sampling efficiency of the group. The approximation formula for the standard error of the mean of a continuous variable is:

$$\text{Standard error} = [S_2/(N \times E)]^{1/2}$$

where S_2 is the variance of responses in the group for the continuous variable (computed with frequencies equal to full-sample weights) and N is the unweighted number of respondents to the question in the group. These formulas were used to compute a total of 300 standard errors for the same variables and groups addressed using pseudo-replication.

- To assess the accuracy of the standard errors produced by these formulas, we used scatter plots to compare them with standard errors produced using pseudo-replication. For both nominal and continuous variables, the approximate best fit was a 45 degree line. That is, on average, the formula based on estimates of effective sample size neither systematically overestimated nor underestimated the standard error obtained using pseudo-replication, arguing for use of the more cost-effective estimation formulas. However, because error remains in the estimates that might result in underestimating the true standard errors in some instances, we took a conservative approach and multiplied the standard errors produced using the estimation formulas by 1.25. The vast majority of the standard errors so obtained were larger than the standard errors obtained by pseudo-replication. Thus, standard errors were calculated using the effective sample size estimation formulas and increased by a factor of 1.25.

Creating Comparison Groups from the General Population of Youth

We have created two comparison groups from the general population of youth to use as benchmarks against which to interpret outcomes of youth with disabilities. The first group is a sample of youth from the general population, based on data from the National Longitudinal Survey of Youth (NLSY, U.S. Department of Labor). This group permits us to identify differences between youth with disabilities and the general population. However, we cannot attribute those differences to the presence of a disability because Chapter 2 has illustrated that youth with disabilities differed from youth in the general population on demographic

characteristics that would be expected to influence their outcomes (e.g., gender, ethnicity). Hence, a second comparison group was constructed from the NLSY that has the same distribution as youth with disabilities on important demographic variables. The construction of these two groups is described below.

The NLSY contains data for more than 12,000 noninstitutionalized youth who were between the ages of 13 and 21 in 1979. These youth have been interviewed annually from 1979 to the present concerning a wide variety of topics, including their family background, schooling, employment, marital status, and living arrangements. For the present study, data from the 1979-1983 interviews were used; after those years, youth in the NLSY were generally older than youth in the NLTS.

Because the universe of the NLTS is youth who were in special education programs in 1985-86, while the universe for the NLSY is all youth (regardless of present or past school status), the following steps were taken to achieve comparability. First, only NLSY youth who were currently in school or had been in school during the current or previous academic year were included in the analysis. Second, comparisons were restricted to youth between 15 and 20 years of age. This was done primarily because very few NLSY youth over age 20 met the requirement of having been in secondary school the academic year before the interview. Little is lost by this restriction because the NLTS sample contains very few individuals below the age of 15 and relatively few over age 20.

Thus, we used all the in-school observations and any observations when a person was out of school, but had been in school during the academic year before the interview. There were up to 5 in-school interviews for a given youth. For most people, only one out-of-school observation was included. Two out-of-school interviews could occur if a youth left school during an academic year but before the spring interview. In that case, the interviews of the spring of that academic year and the next spring were included.

NLSY provides sampling weights based on respondents' probability of selection. However, our use of multiple observations per respondent for many analyses resulted in older youth being overrepresented. We corrected this bias by multiplying each individual's weight by:

$$\frac{\text{Weighted N of individuals of the youth's age in 1980}}{\text{Weighted N of the youth's age for all observations in the sample.}}$$

For analyses that used multiple observations, this weight was used. For analyses that used one observation only (for instance, data on arrests came only from the 1980 interview), the original weight supplied by the NLSY was used.

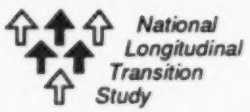
As indicated above, youth with disabilities differ in several demographic characteristics from the general population of youth. The comparison group we constructed to "hold constant" these differences was formed by weighting the NLSY data to match the distribution of selected

demographic characteristics of youth with disabilities. Using these weights, the comparison population has the same distributions of gender, ethnicity, and head of household's education as the population of youth with disabilities.

Despite our adjustments, some important noncomparabilities remain. They are as follows:

- ***Respondent***. NLTS interviewed parents, while NLSY interviewed youth. Although there is some evidence that parents in the general population tend to underreport the employment activities of their teenage children (Freeman and Medoff, 1982), the extent to which parents and youth differ in reporting other phenomena is not known.
- ***Month of interview***. The modal month of interview was August for the NLTS and March for the NLSY. The two outcomes most affected by differences in timing of interview are school completion status and employment status. Fortunately, NLSY data included youths' employment status as of August 15, and we were able to construct a variable on school completion status as of the summer after the interview. However, most data on occupational distributions, part-time/full-time status, and wages come from the summer for NLTS youth and the spring for NLSY youth.
- ***Year of interview***. NLTS interviews took place in 1987, while NLSY data come from 1979-1982. Readers should be sensitive to the fact that period effects may have influenced some variables. We adjusted for period effects for only one variable, wages, by operationalizing wages as the percent of the population earning the minimum wage or less.
- ***Time out of school***. The most important consequence of differences in the month of interview affect analyses of data for youth who were no longer in secondary school. More than three-fourths (76%) of NLSY secondary school graduates in the sample (weighted) had been out of school between 9 and 11 months when they were interviewed. In contrast, about 56% of NLTS graduates had been out of school about 2 months, and about 44% had been out of school about 14 months.
- ***Unmeasured or uncontrolled demographic differences***. The groups may continue to differ in unmeasured ways or in ways that were not adjusted for in the reweighting. For example, we were not able to weight the comparison population by urbanicity, despite knowing that NLTS and NLSY samples differ significantly on this factor, because of noncomparability of the measures of urbanicity in the two data sets.
- ***Exact wording of questions and response categories***. Wording of questions and response categories differed between the NLTS and the NLSY. Considerable research has shown responses to items can be affected by these types of differences (e.g., Schwarz and Hippler, 1990).

National Longitudinal Transition Study of Special Education Students



Reports and Papers Based on the NLTS

Papers available:

- "The Early Work Experiences of Youth with Disabilities: Trends in Employment Rates and Job Characteristics." R. D'Amico and C. Marder, September 1991. 55 pp. $15.00. [Order No. 147]

- "Dropouts with Disabilities: What Do We Know? What Can We Do?" M. Wagner, September 1991. 80 pp. $15.00. [Order No. 146]

- "How Well Are Youth with Disabilities Really Doing Compared with the General Population?" C. Marder, 1991. 21 pp. $10.00. [Order No. 144]

- "Youth with Disabilities: How Are They Doing? The First Comprehensive Report from the National Longitudinal Transition Study of Special Education Students." M. Wagner et al. September 1991. 600 pp. $40.00. [Order No. 135]

- "Parents' Reports of Students' Involvement with Vocational Rehabilitation Agencies in the First Years After Secondary School." M. Wagner and R. Cox, 1991. 50 pp. $12.00. [Order No. 134]

- "The Relationship Between Social Activities and School Performance for Secondary Students with Learning Disabilities." L. Newman, 1991. 52 pp. $10.00. [Order No. 133]

- "The Benefits Associated with Secondary Vocational Education for Young People with Disabilities." M. Wagner, 1991. 66 pp. $10.00. [Order No. 132]

- "The National Longitudinal Transition Study of Special Education Students: Report on Sample Design and Limitations, Wave 1 (1987)." H. Javitz and M. Wagner, 1990. 71 pp. $18.00. [Order No. 131]

- "The National Longitudinal Transition Study of Special Education Students: Report on Procedures for the First Wave of Data Collection (1987)." M. Wagner, L. Newman, and D. Shaver, 1989 (includes data collection instruments). 280 pp. $25.00. [Order No. 126]

- "The School Programs and School Performance of Secondary Students Classified as Learning Disabled: Findings from the National Longitudinal Transition Study of Special Education Students." M. Wagner, 1990. 27 pp. $10.00 [Order No. 125]

- "Youth with Disabilities During Transition: An Overview of Descriptive Findings from the National Longitudinal Transition Study," by M. Wagner. Prepared for the annual meeting of the American Educational Research Association, San Francisco, 1989. 25 pp. (An overview of reports no. 115, 116, 117, and 118, released with the approval of the U.S. Department of Education.) $10.00. [Order No. 119]

The NLTS is being conducted by SRI International under contract to the Office of Special Education Programs of the U.S. Department of Education. Data were collected from more than 8,000 youth in 1987 from parent interviews, a survey of school staff, and from their school records. The youth were ages 15 to 23 when data were collected; about two-thirds were in secondary school, and one-third had exited secondary school. Data have been weighted to represent the national secondary school-age special education population.

• "The Transition Experiences of Youth with Disabilities: A Report from the National Longitudinal Transition Study." M. Wagner, 1989. 42 pp. $10.00. [Order No. 118]

• "Making the Transition: An Explanatory Model of Special Education Students' Participation in Postsecondary Education." P. Butler-Nalin, C. Marder, and D. Shaver, 1989. $10.00. [Order No. 117]

• "Educational Programs and Achievements of Secondary Special Education Students: Findings from the National Longitudinal Transition Study." M. Wagner and D. Shaver, 1989. 41 pp. $10.00. [Order No. 116]

• "Dropouts: The Relationship of Student Characteristics, Behaviors, and Performance for Special Education Students." P. Butler-Nalin and C. Padilla, 1989. 41 pp. $10.00. [Order No. 115]

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